

FIG. 1

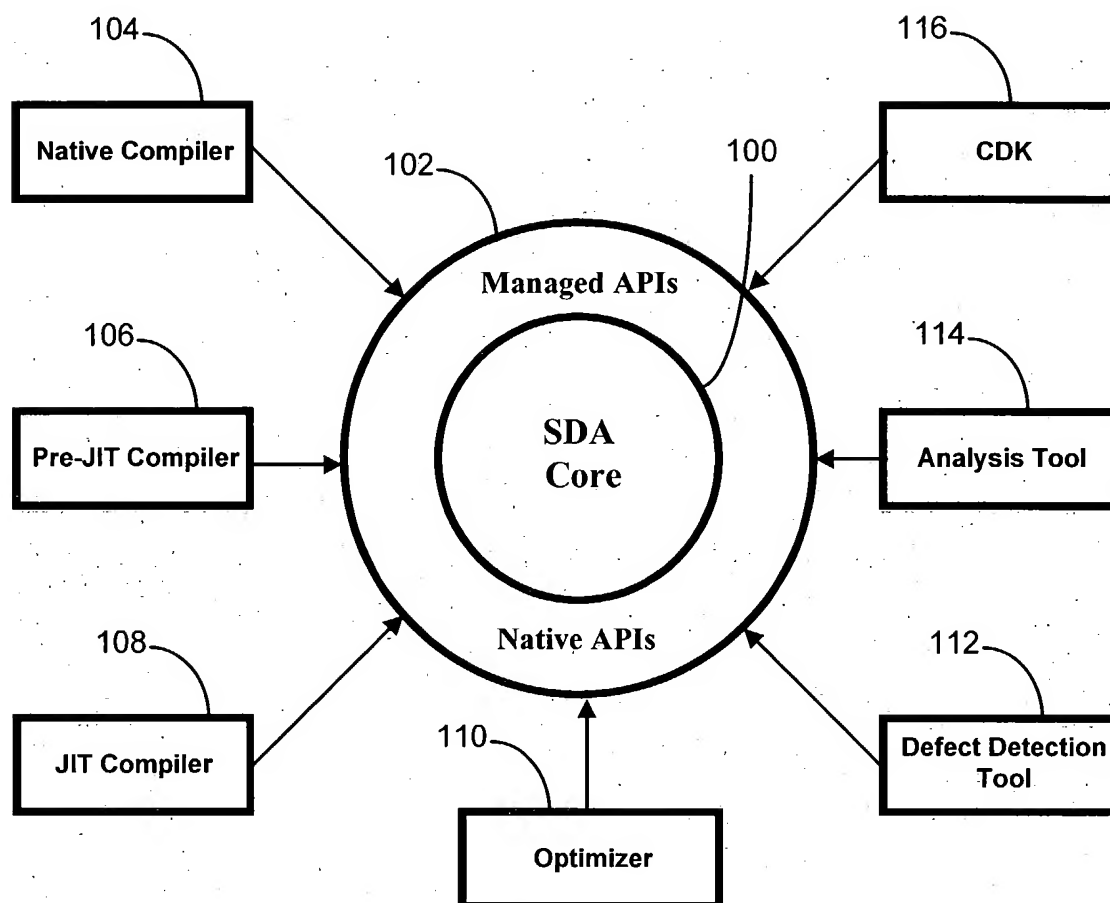


FIG. 2(a)

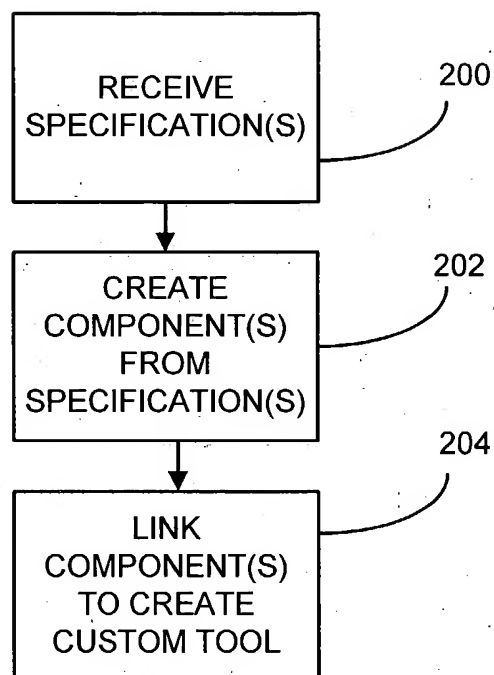


FIG. 2(b)

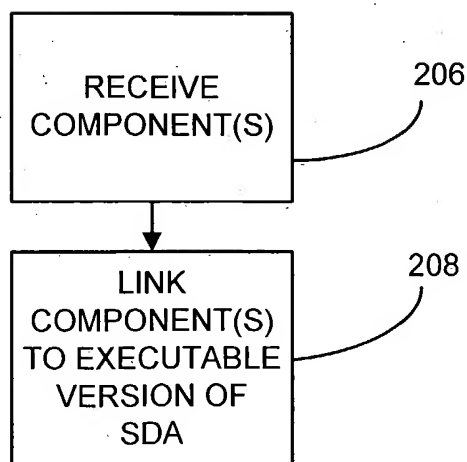
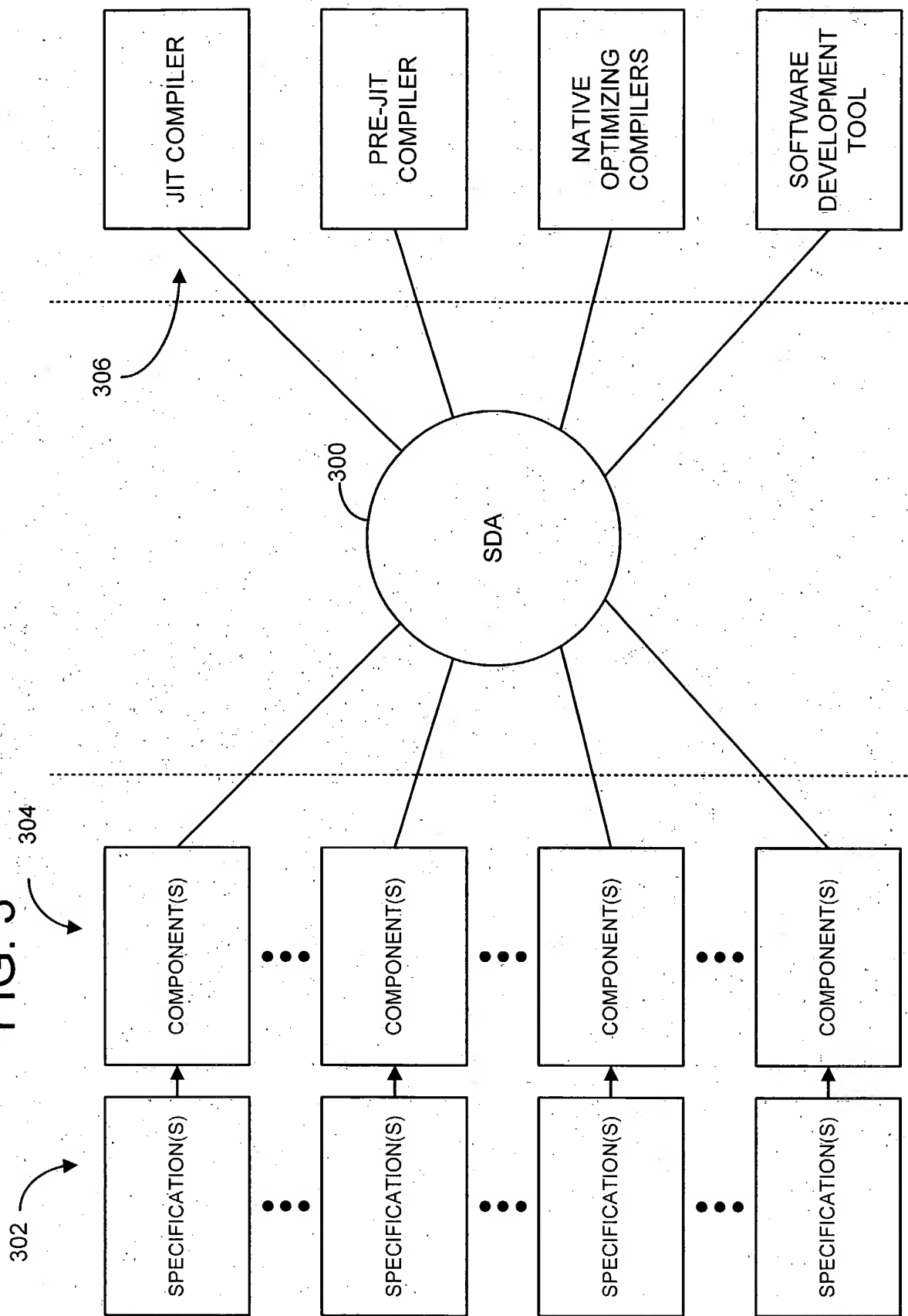


FIG. 3



Stephen A. Wright
Klarquist Sparkman, LLP
121 S.W. Salmon Street, Suite 1600
Portland, Oregon 97204
(503) 226-7391

Inventor (s): Grover et al.
Date of Deposit: July 25, 2003
Express Mail Label No. EV351283281US
Title: SOFTWARE DEVELOPMENT INFRASTRUCTURE
Attorney Matter No.: 3382-65598/HEK
Page 3 of 27

Stephen A. Wight
 Klarquist Sparkman, LLP
 121 S.W. Salmon Street, Suite 1600
 Portland, Oregon 97204
 (503) 226-7391

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 Page 4 of 27

FIG. 4

Target Specific Code

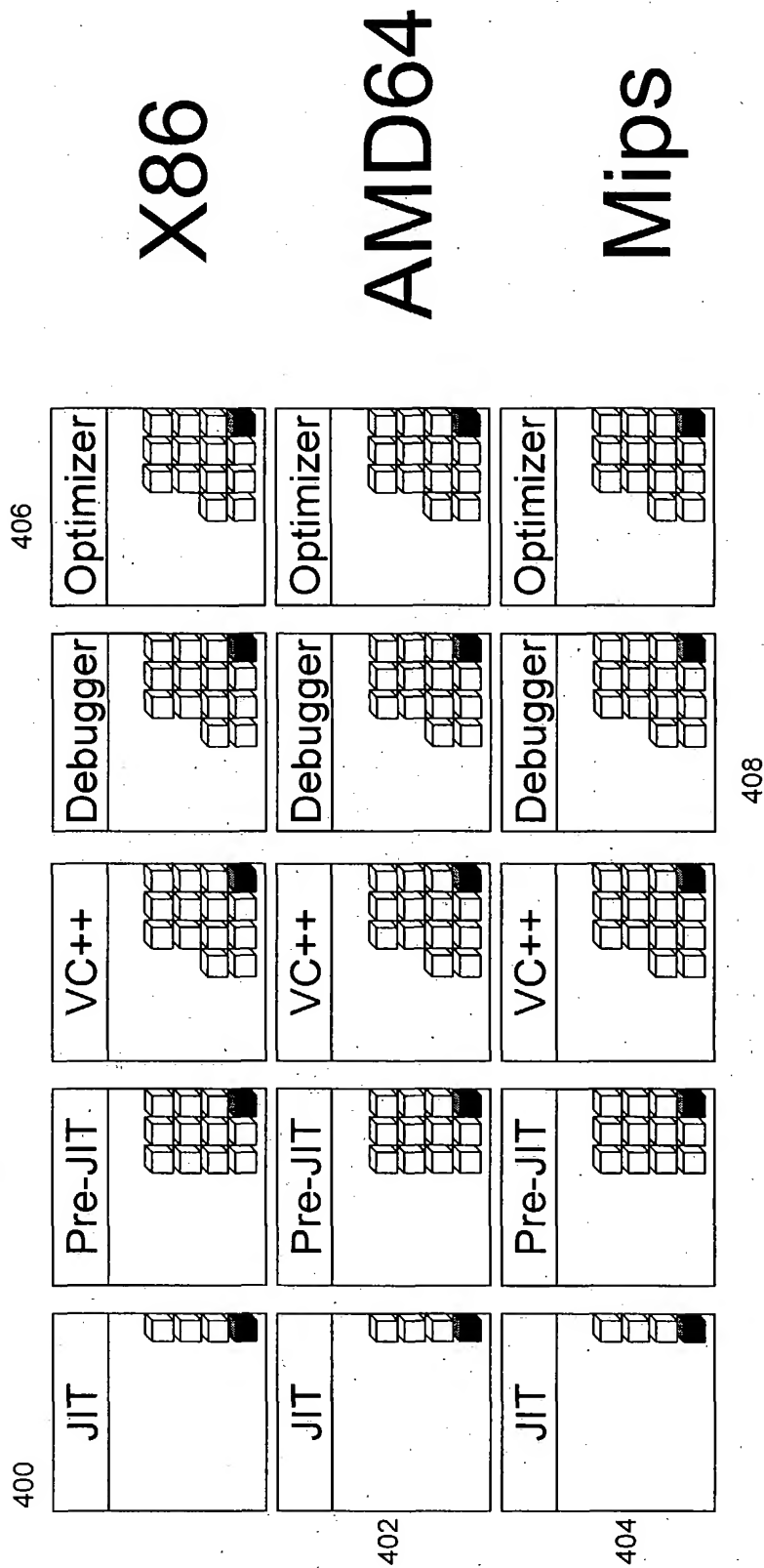
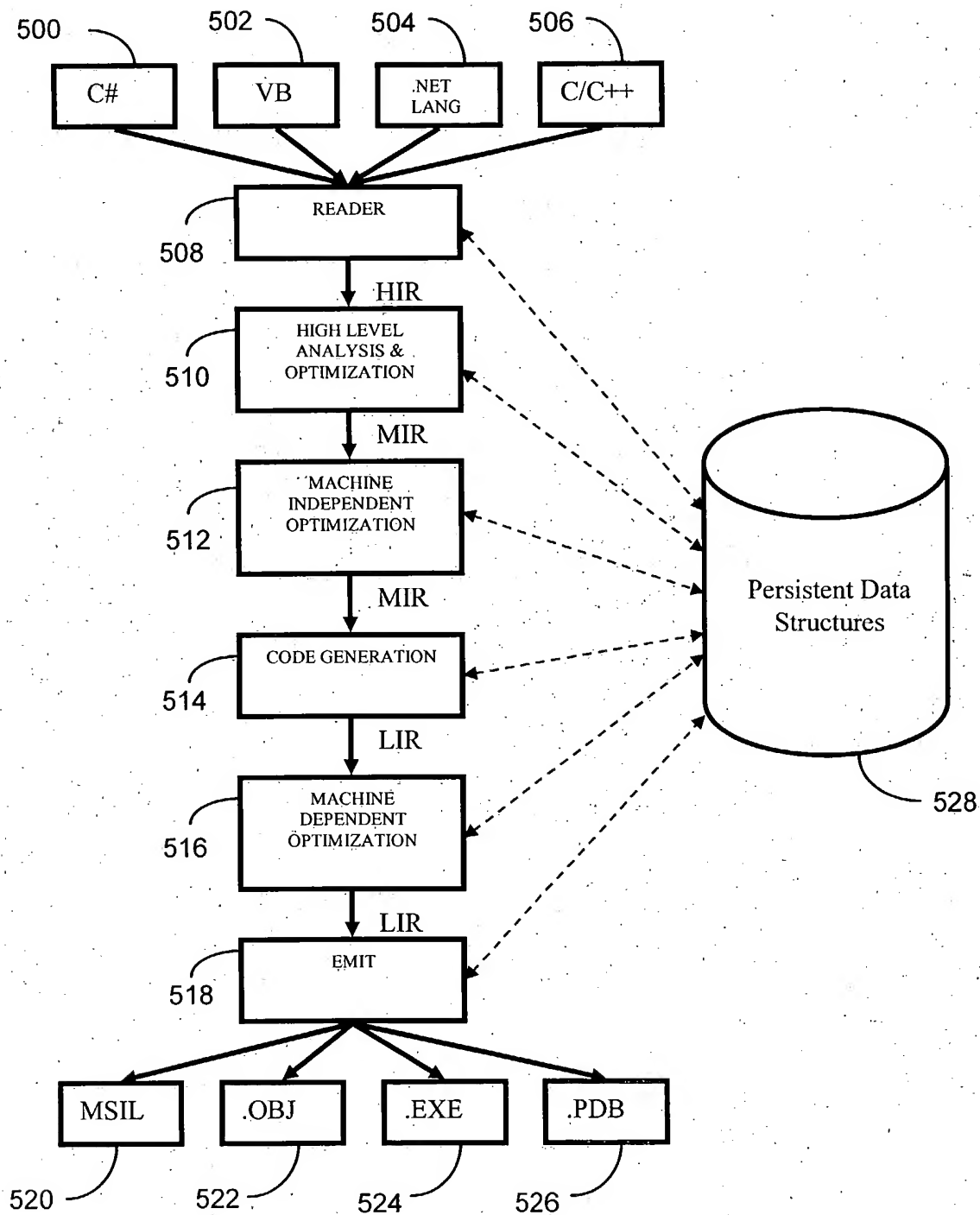


FIG. 5



Source

FIG. 6(a)

```
int foo(int a, int b)
{
    int r;

    if (a < b)
    {
        r = a + 1;
    }
    else
    {
        r = b + 1;
    }

    return r;
}
```

FIG. 6(b)

Dump of high-level, machine independent IR

	<u>a.i32, b.i32</u>	= ENTER foo	#4
	t107.cond	= CMP(LT) <u>a.i32, b.i32</u>	#7
		CBRANCH(LT) t107.cond, L2, L1	#7
L2:			#7
	t108.i32	= ADD <u>a.i32, 1.i32</u>	#9
	<u>r.i32</u>	= ASSIGN t108.i32	#9
		GOTO L3	#11
L1:			#7
	t109.i32	= ADD <u>b.i32, 1.i32</u>	#13
	<u>r.i32</u>	= ASSIGN t109.i32	#13
		GOTO L3	#11
L3:			#11
		RETURN <u>r.i32</u>	#16
		GOTO L4	#16
L4:			#16
		EXIT foo	#17

FIG. 6(c)

Dump of high-level with SSA, machine independent IR

Explicit wiring of SSA graph using definition numbers shown in <#> blue.

```
<1>_a.i32, <2>_b.i32      = ENTER _foo                      #4
    <3>t107.cond           = CMP(LT) <1>_a.i32, <2>_b.i32      #7
                           CBRANCH(LT) <3>t107.cond, L2, L1    #7
L2:                        #7
    <4>t108.i32             = ADD <1>_a.i32, 1.i32            #9
    <5>_r.i32               = ASSIGN <4>t108.i32               #9
                           GOTO L3                             #11
L1:                        #7
    <6>t109.i32             = ADD <2>_b.i32, 1.i32            #13
    <7>_r.i32               = ASSIGN <6>t109.i32               #13
                           GOTO L3                             #11
L3:                        #11
    <8>_r.i32               = PHI <5>_r.i32, <7>_r.i32        #16
                           RETURN <8>_r.i32                  #16
                           GOTO L4                             #16
L4:                        #16
                           EXIT _foo                          #17
```

FIG. 6(d)

Dump of low-level, machine dependent IR (target X86)

```
_a.i32, _b.i32      = ENTER _foo                      #4
{ESP}              = push EBP.i32, {ESP}              #4
EBP.i32             = mov ESP.i32                      #4
ESP.up32->unk, EFLAGS.cc32 = sub ESP.up32->unk, 4.i32    #4
                    PROLOGEND                          #4
t110(EAX).i32       = mov _b[EBP.up32->unk].i32.a32     #7
t107(EFLAGS).cond   = cmp(LT) _a[EBP.up32->unk].i32.a32, t110(EAX).i32 #7
                    jge(GE) t107(EFLAGS).cond, L1      #7
L2:                 #7
    tv108-(EAX).i32  = mov 1.i32                        #9
    tv108-(EAX).i32, EFLAGS.cc32 = add tv108-(EAX).i32, _a[EBP.up32->unk].i32.a32
#9
    _r[EBP.up32->unk].i32.a32 = mov tv108-(EAX).i32      #9
                    jmp L3                               #11
L1:                 #7
    tv109-(EAX).i32  = mov 1.i32                        #13
    tv109-(EAX).i32, EFLAGS.cc32 = add tv109-(EAX).i32, _b[EBP.up32->unk].i32.a32
#13
    _r[EBP.up32->unk].i32.a32 = mov tv109-(EAX).i32      #13
L3:                 #11
    t113(EAX).i32    = mov _r[EBP.up32->unk].i32.a32     #16
L4:                 #16
                    EPILOGSTART                         #17
    ESP.i32          = mov EBP.i32                      #17
    EBP.i32, {ESP}    = pop {ESP}                       #17
    {ESP}            = ret {ESP}                        #17
                    EXIT _foo, t113(EAX).i32            #17
```

FIG. 7

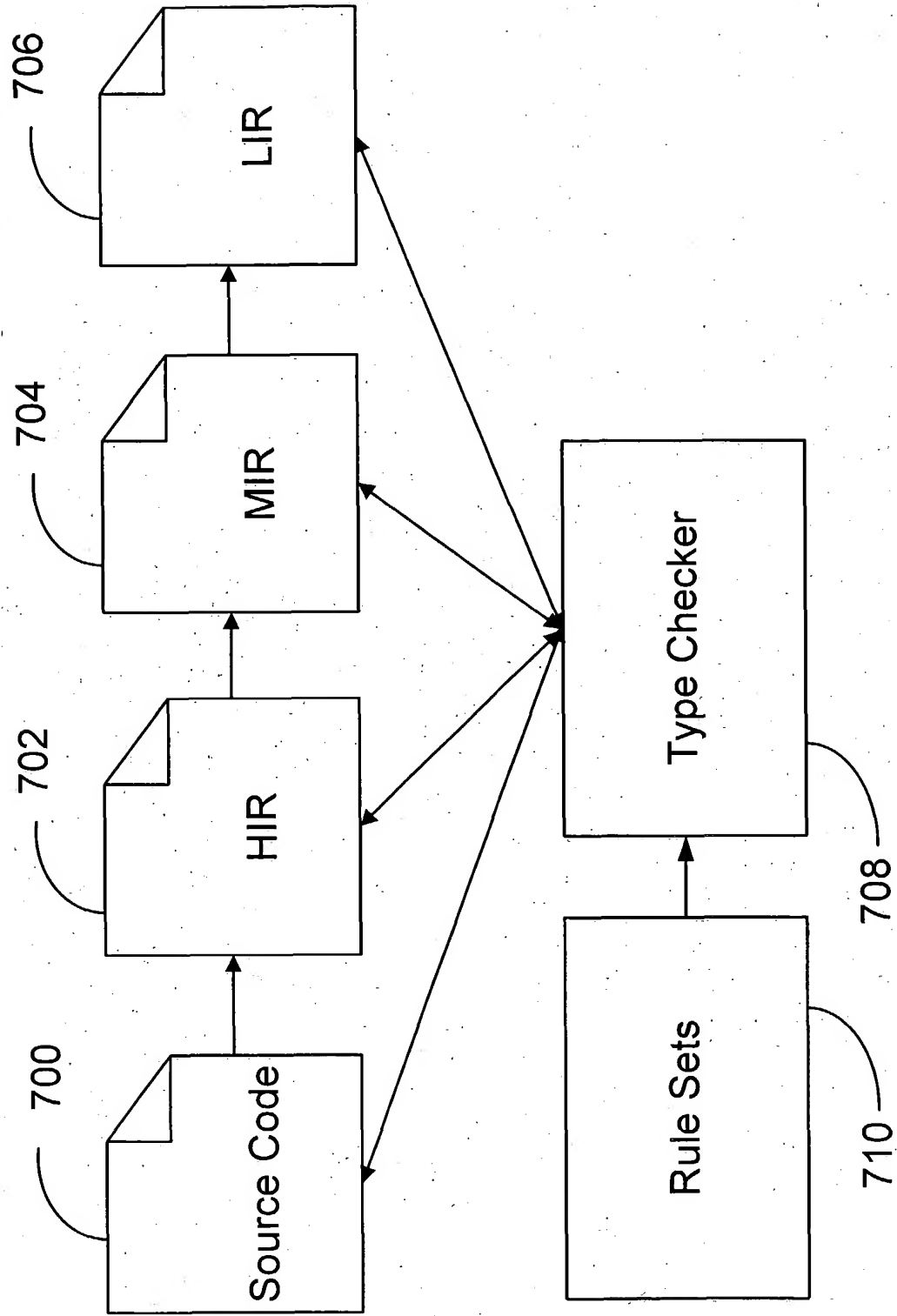


FIG. 8

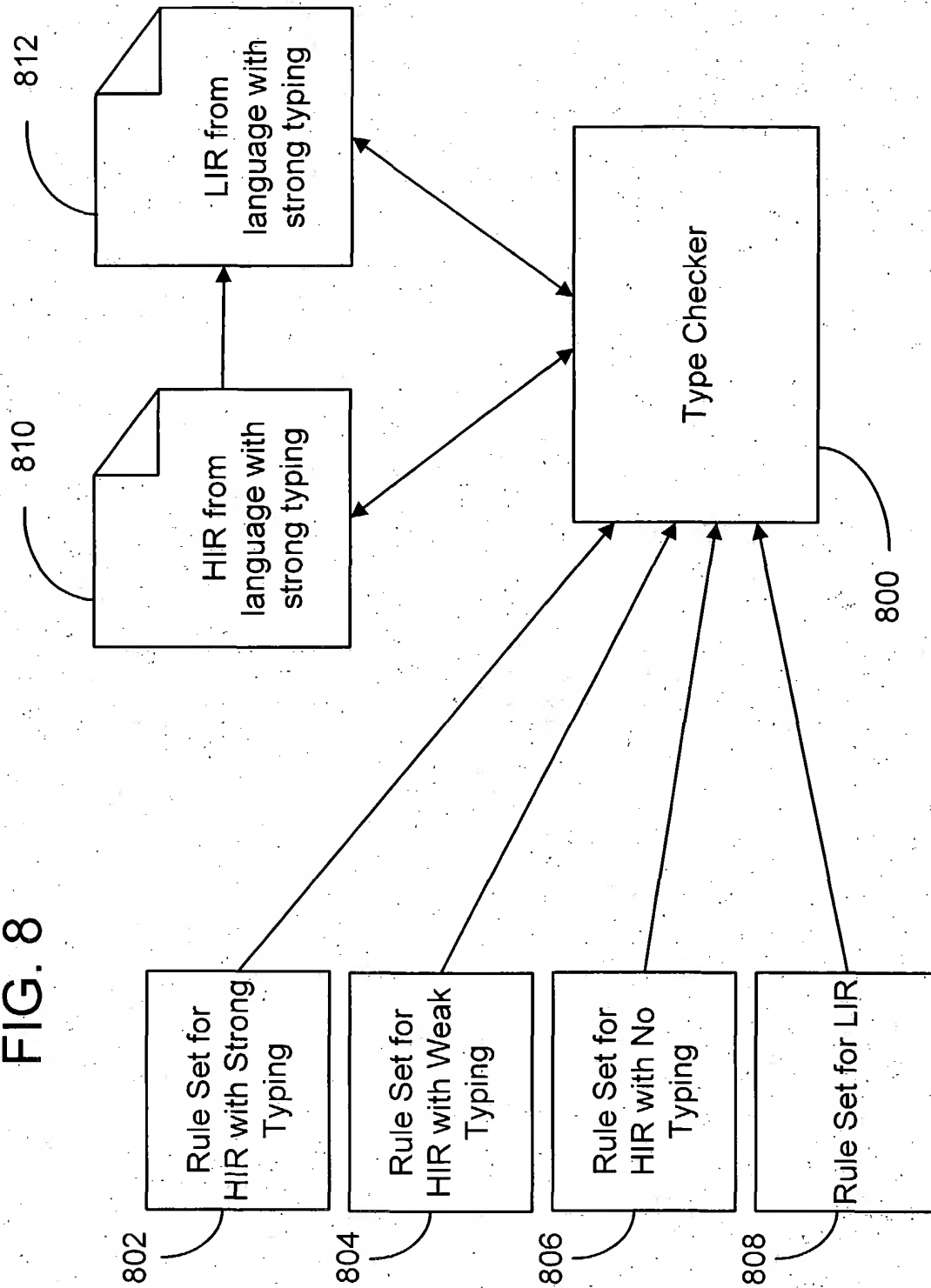
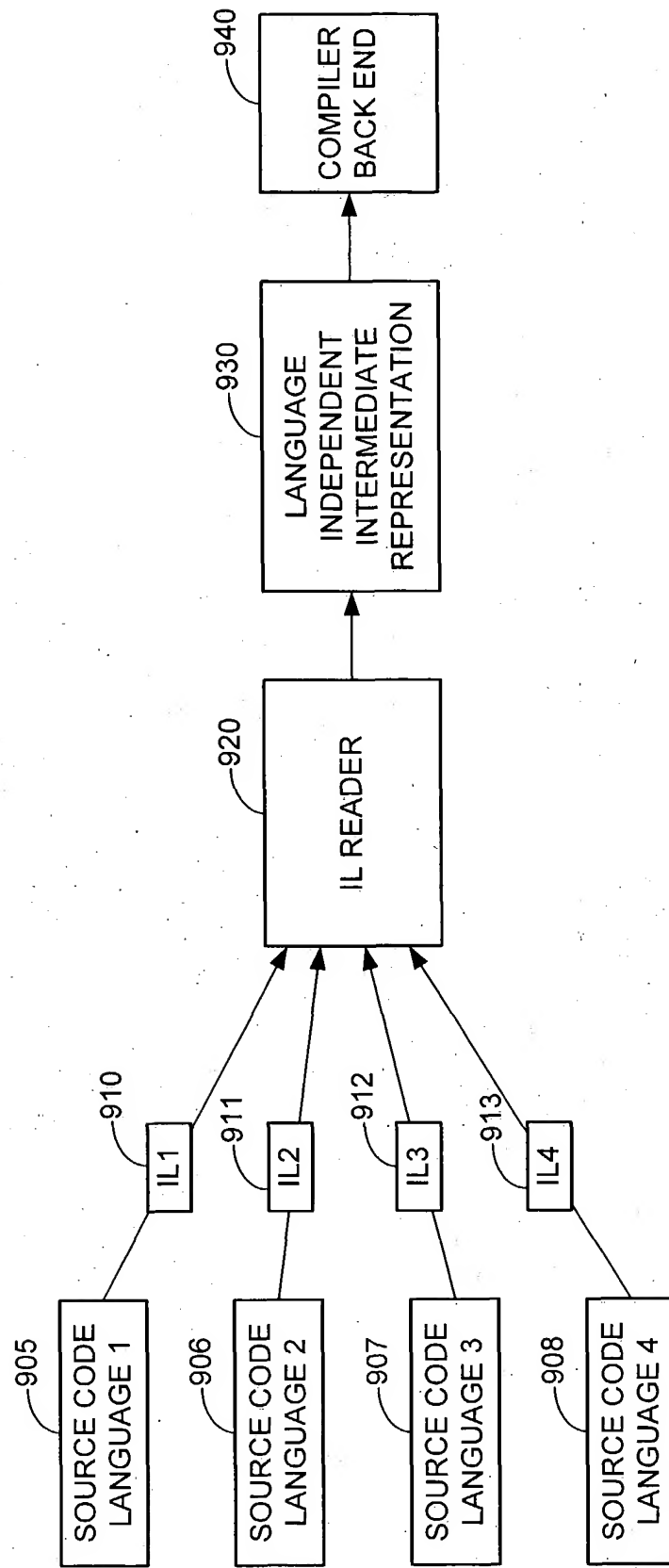


FIG. 9



Stephen A. Wight
Klarquist Sparkman, LLP
121 S.W. Salmon Street, Suite 1600
Portland, Oregon 97204
(503) 226-7391

Inventor (s): Grover et al.
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Attorney Matter No.: 3382-65598/HEK
Page 10 of 27

FIG. 10A

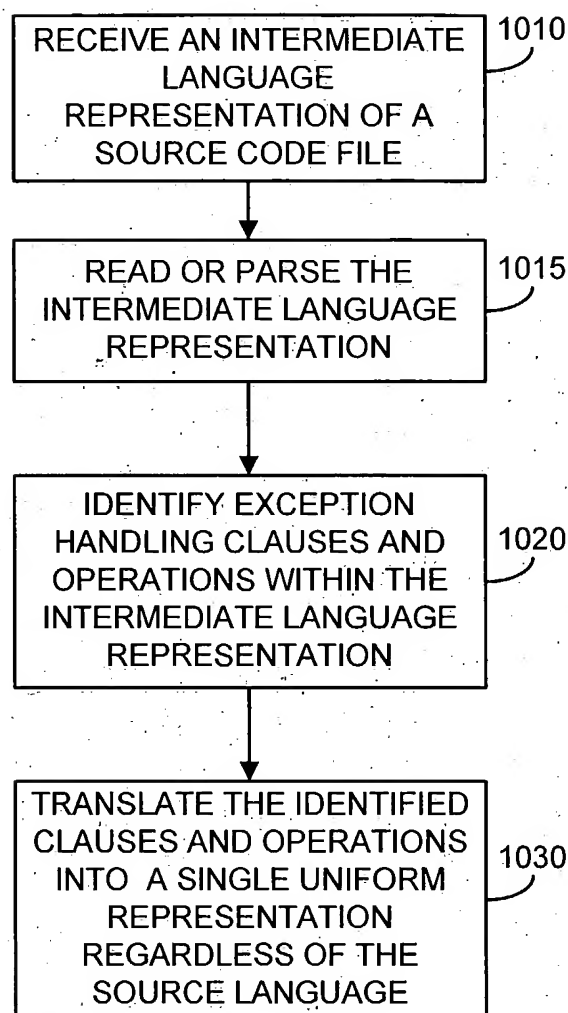


FIG. 10B

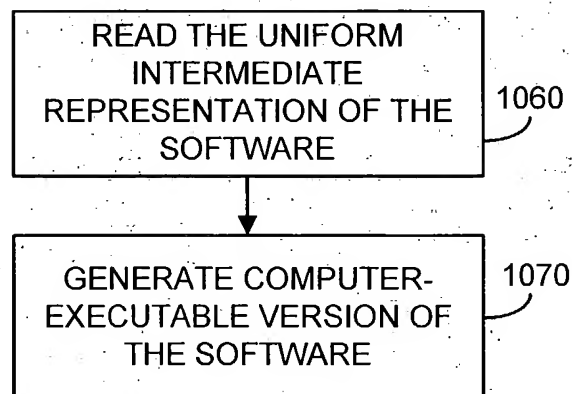
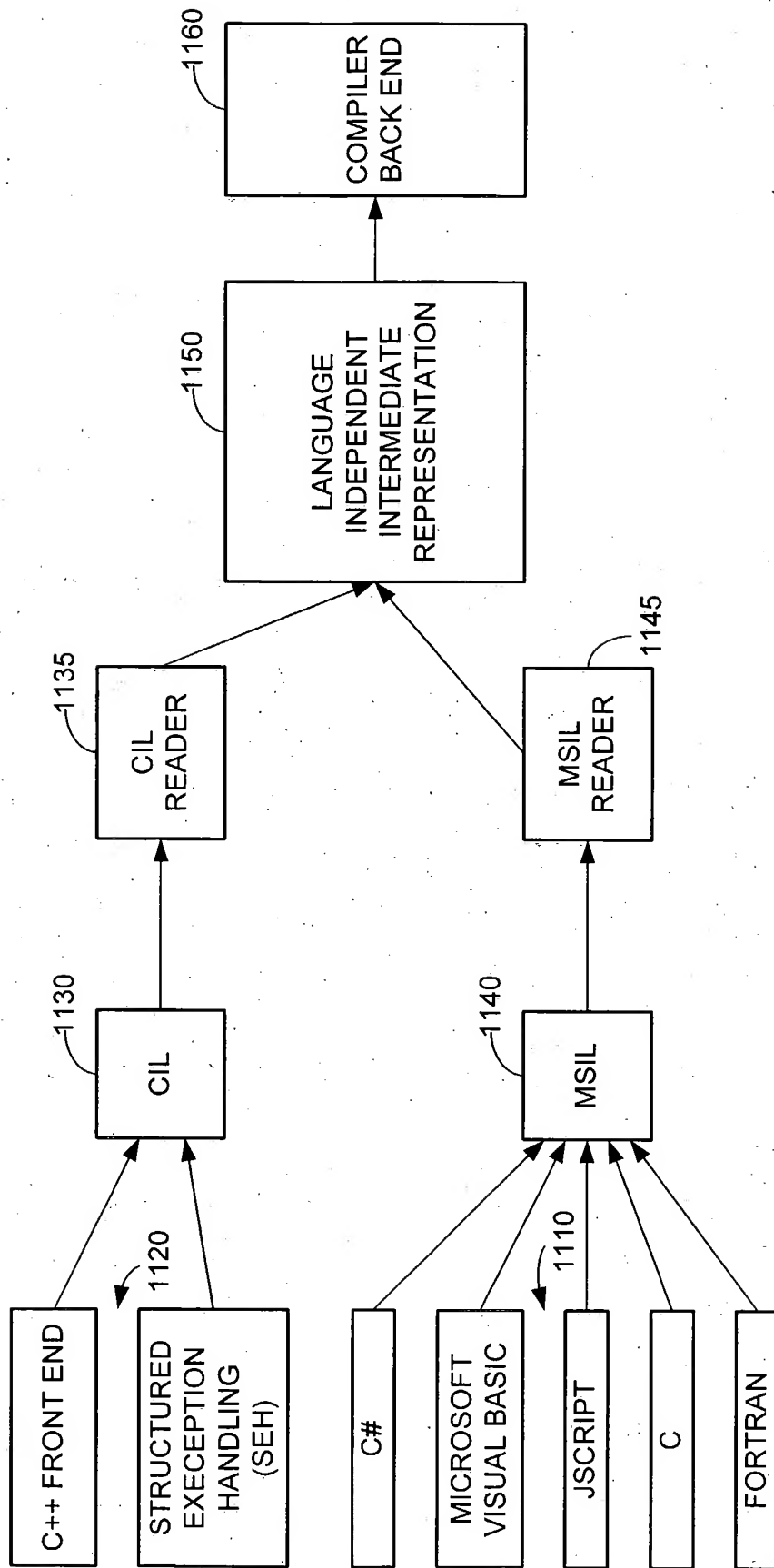


FIG. 11



```

graph TD
    CS[Common Specification 1204] --> RT[Retargeting Tool 1202]
    S[Specification 1200] --> RT
    RT --> lex[lex 1206]
    RT --> yacc[.yacc 1208]
    RT --> hcpp[h/.cpp 1210]
    RT --> CL1[CL 1212]
    RT --> hclcpp[h/.cl.cpp 1214]
    lex --> CL1
    yacc --> CL1
    CL1 --> hclcpp
    CF[Common Framework 1218] --> IHC[Integrated h/.cpp 1220]
    hcpp --> IHC
    IHC --> CL2[CL 1222]
    CL2 --> TC[Target Compiler 1224]
    hclcpp --> IHC
  
```

FIG. 13

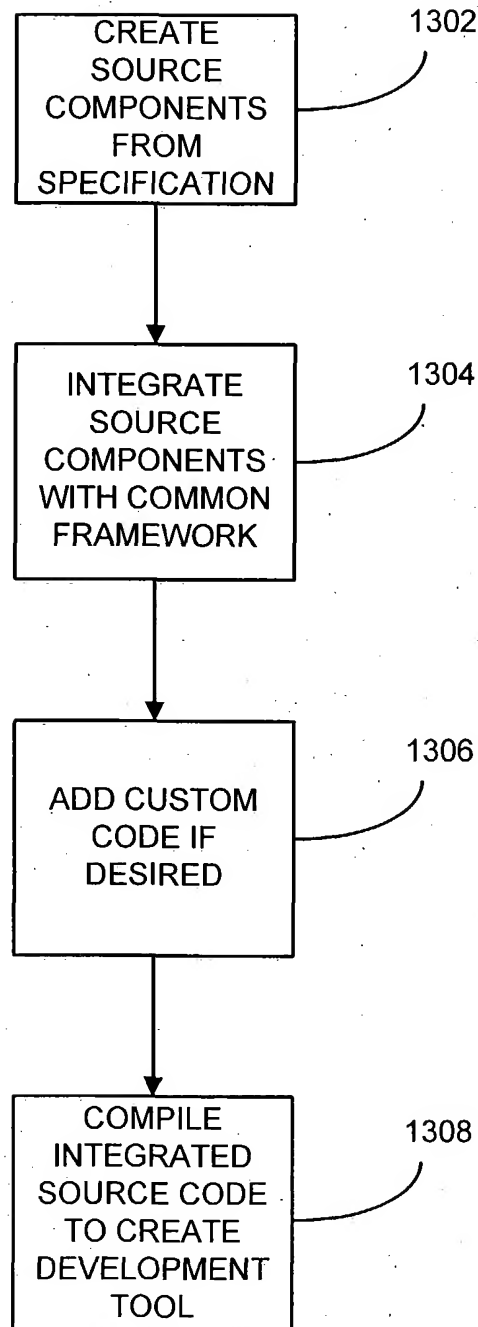


FIG. 14(a)

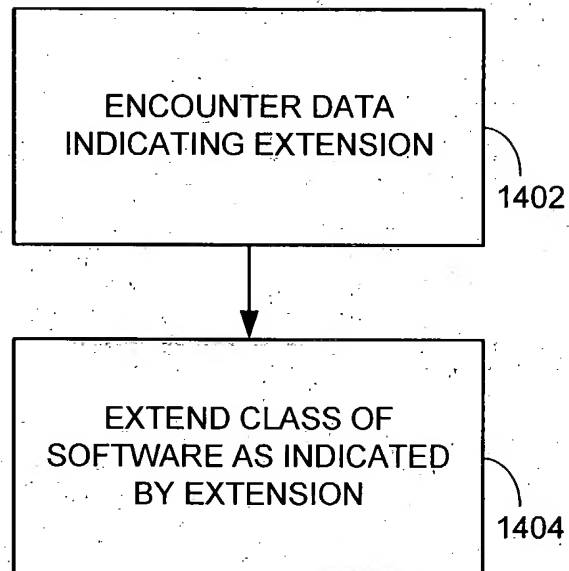


FIG. 14(b)

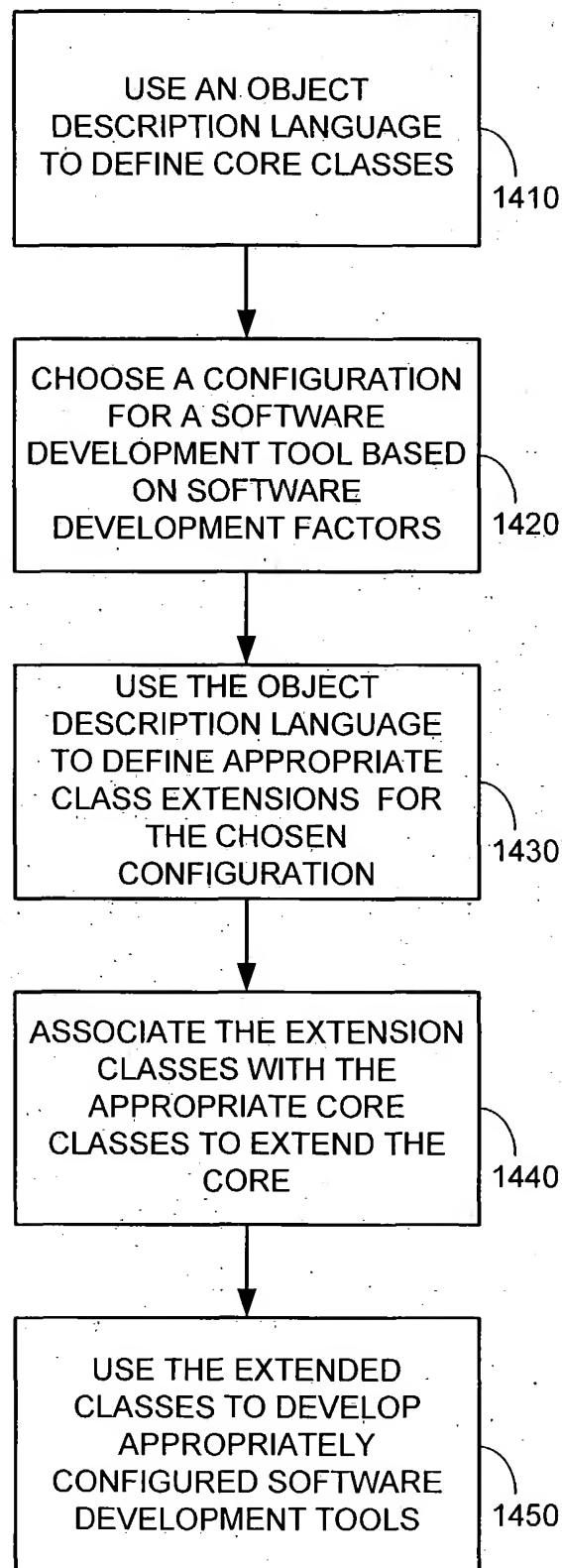


FIG. 15(a)

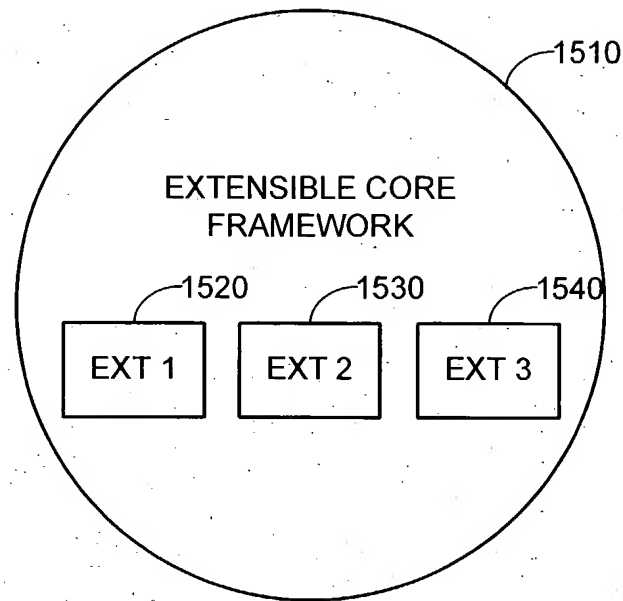


FIG. 15(b)

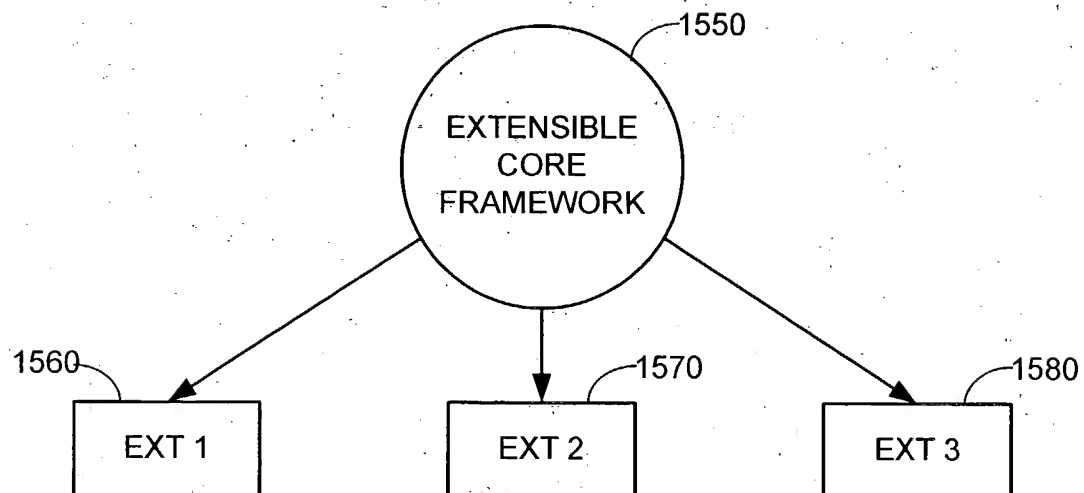


FIG. 16

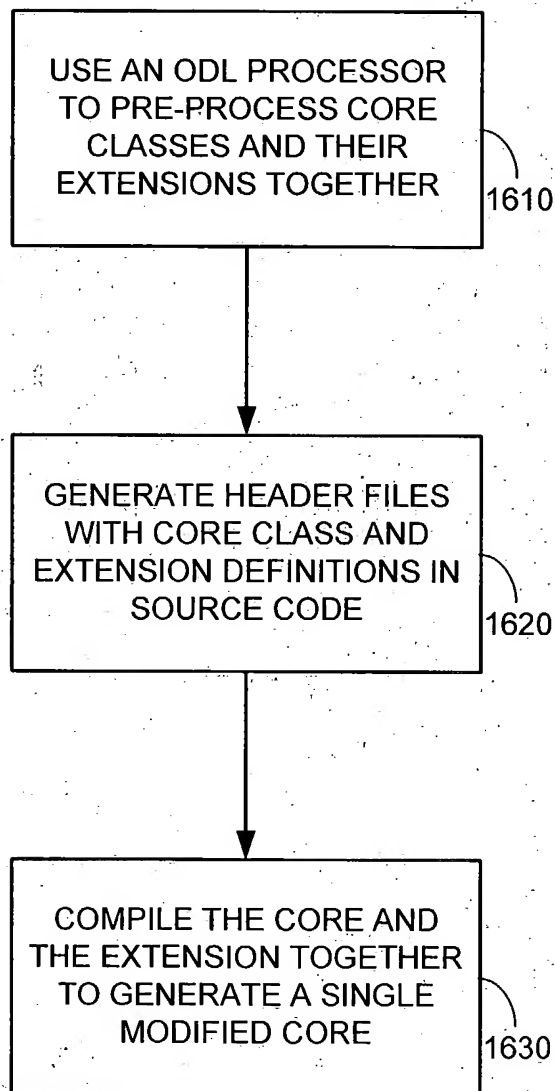


FIG. 17

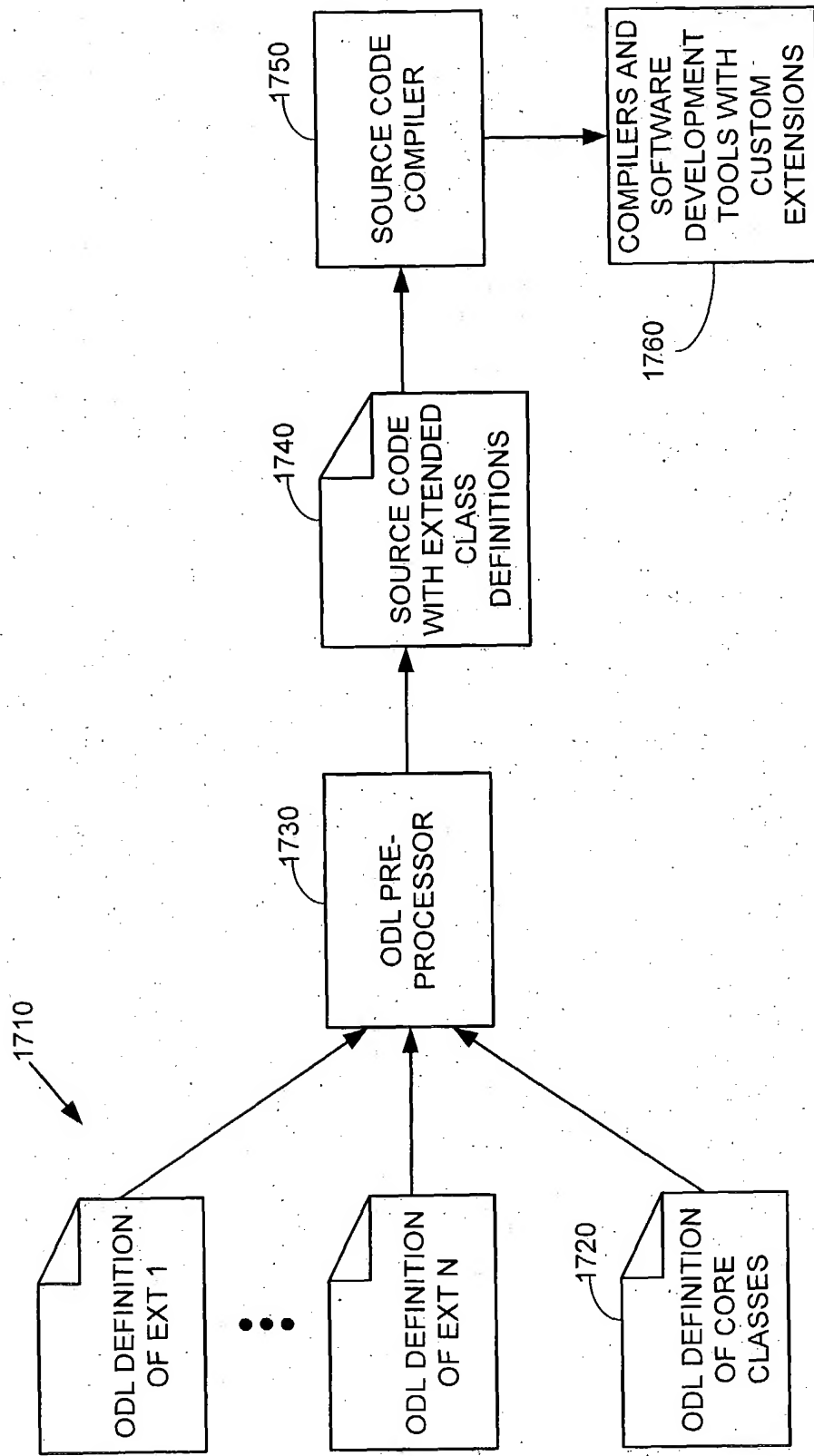


FIG. 18

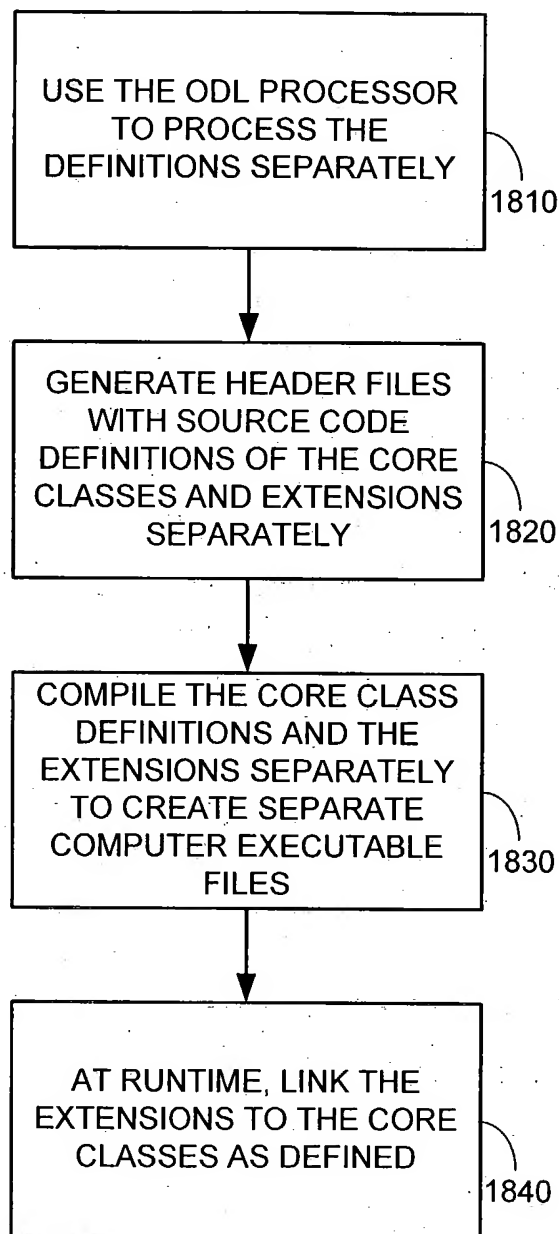
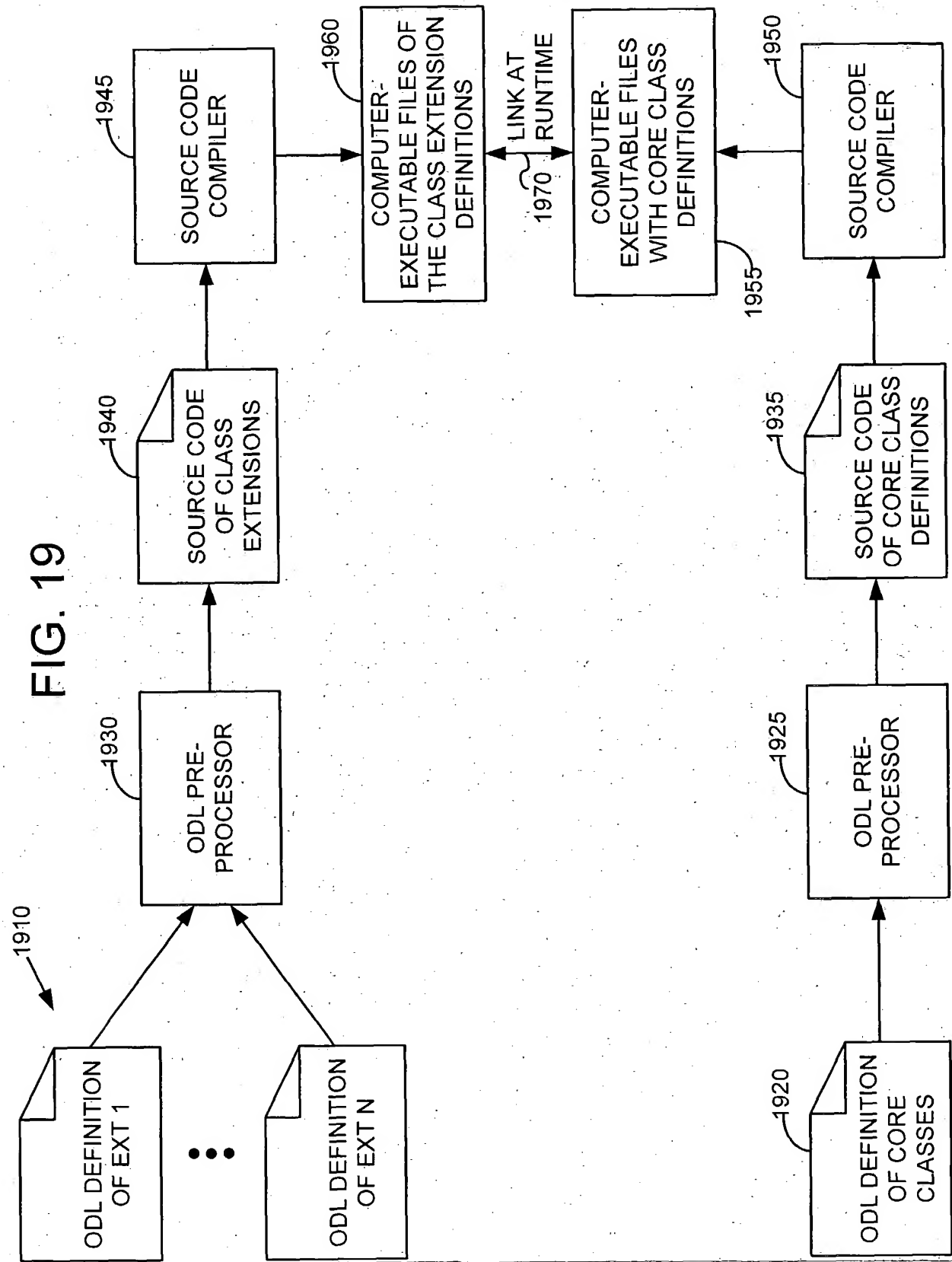


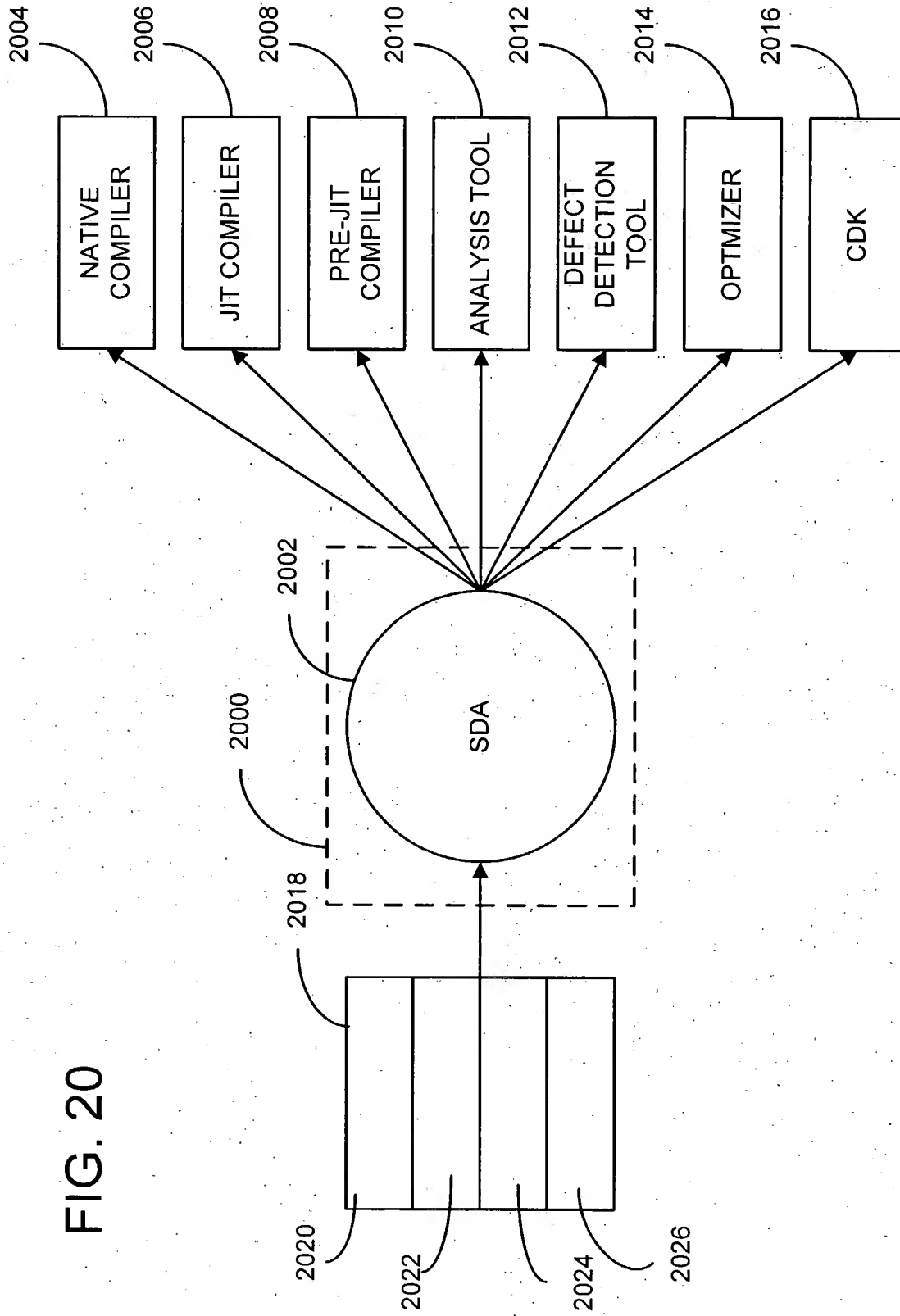
FIG. 19



Stephen A. Wright
Klarquist Sparkman, LLP
121 S.W. Salmon Street, Suite 1600
Portland, Oregon 97204
(503) 226-7391

Inventor(s): Crover et al.
Date of Deposit: July 25, 2003
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Attorney Matter No.: 3382-65598/HEK
Page 21 of 27

FIG. 20



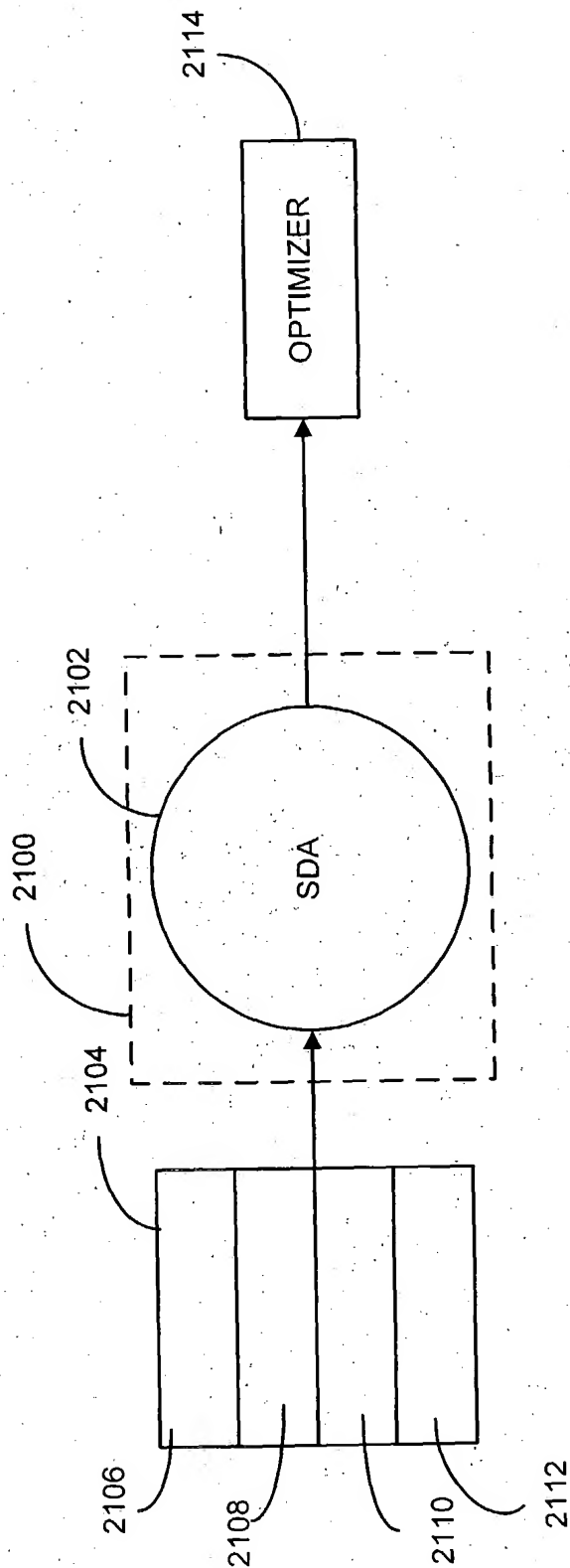
Stephen A. Wight
Klarquist Sparkman, LLP
121 S.W. Salmon Street, Suite 1600
Portland, Oregon 97204
(503) 226-7391

Inventor(s): Grover et al.
Date of Deposit: July 25, 2003
Express Mail Label No. EV351283281US
Title: SOFTWARE DEVELOPMENT INFRASTRUCTURE
Attorney Matter No.: 3382-65598/HEK
Page 22 of 27

Stephen A. Wight
Klarquist Sparkman, LLP
121 S.W. Salmon Street, Suite 1600
Portland, Oregon 97204
(503) 226-7391

Inventor (s): Grover et al.
Date of Deposit: July 25, 2003
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Attorney Matter No.: 3382-65598/HEK
Page 23 of 27

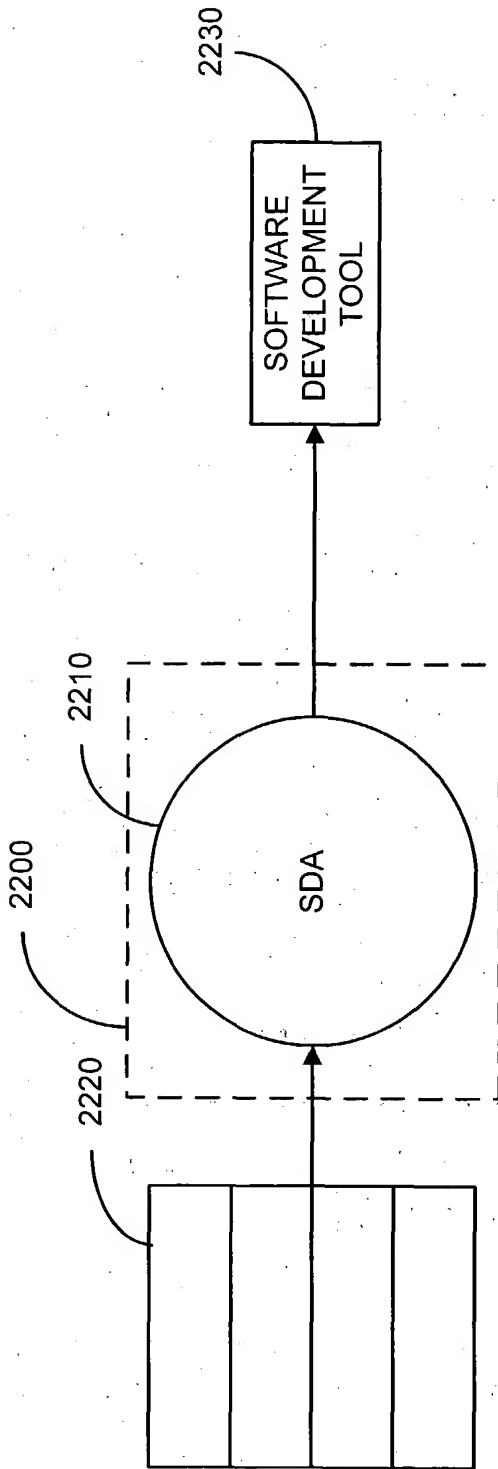
FIG. 21



Stephen A. Wight
Klarquist Sparkman, LLP
121 S.W. Salmon Street, Suite 1600
Portland, Oregon 97204
(503) 226-7391

Inventor (s): Grover et al.
Date of Deposit: July 25, 2003
Express Mail Label No. EV351283281US
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Attorney Matter No.: 3382-65598/HEK
Page 24 of 27

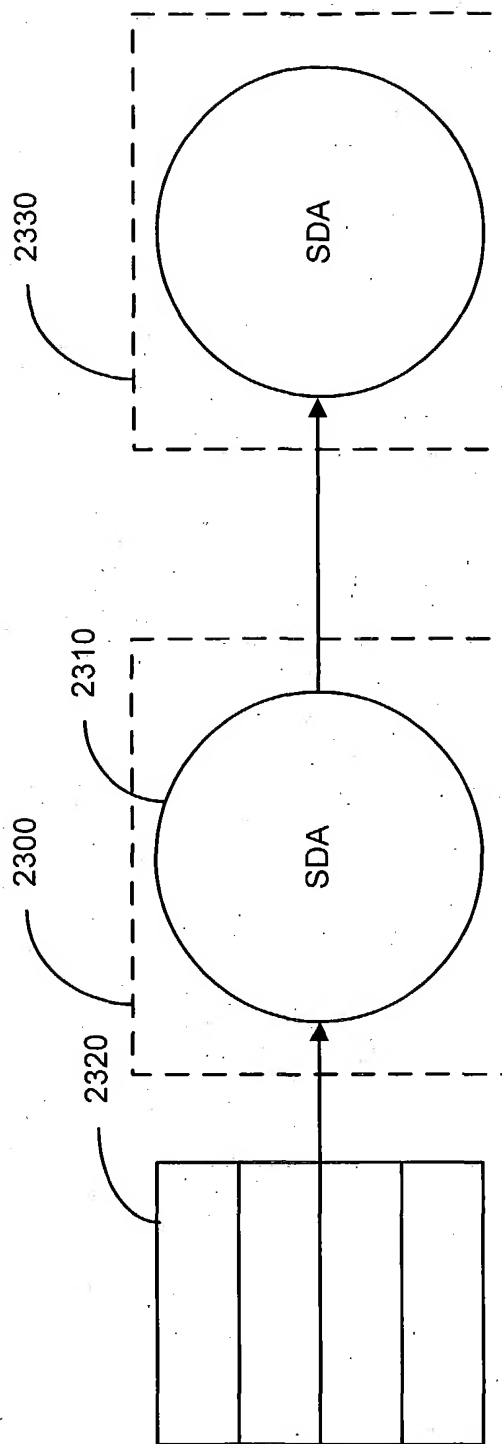
FIG. 22



Stephen A. Wight
 Klarquist Sparkman, LLP
 121 S.W. Salmon Street, Suite 1600
 Portland, Oregon 97204
 (503) 226-7391

Inventor (s): Grover et al.
 Date of Deposit: July 25, 2003
 Express Mail Label No. EV351283281US
 Title: SOFTWARE DEVELOPMENT INFRASTRUCTURE
 Attorney Matter No.: 3382-65598/HEK
 Page 25 of 27

FIG. 23



Stephen A. Wright
 Klarquist Sparkman, LLP
 121 S.W. Salmon Street, Suite 1600
 Portland, Oregon 97204
 (503) 226-7391

Inventor (s): Grover et al.
 Date of Deposit: July 25, 2003
 Express Mail Label No. EV351283281US
 Title: SOFTWARE DEVELOPMENT INFRASTRUCTURE
 Attorney Matter No.: 3382-65598/HEK
 Page 26 of 27

FIG. 24

